

Alternatives analyses and trade studies provide the information and documentation needed to support decision making and justify system design concepts.



Alternatives Analysis and Trade Studies

System design is typically based on customer requirements and on the criteria underlying design decisions. Alternatives analyses and trade studies provide the information and documentation needed to support decision making and justify system design concepts.

Alternatives Analysis

Alternatives analysis is the process of assessing options to perform system functions, creating system scenarios consistent with system modes and performance requirements, and developing alternate system concepts based on scenario and functional definitions. Systems Analyses

and Engineering (SA&E) uses a broad base of experience and expertise to conduct alternatives analyses and guide informed, defensible decisions. Alternatives analysis typically consists of the following activities:

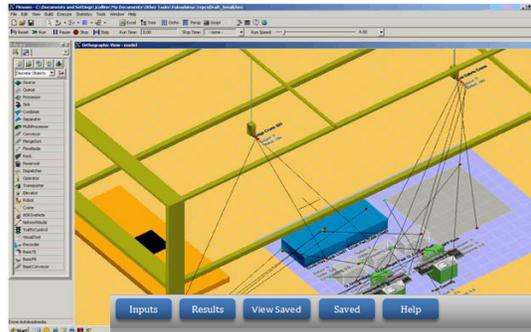
- Conduct design analyses, simulations, and trade studies to measure the anticipated performance of system alternatives
- Conduct life-cycle cost and schedule analyses for each alternative under consideration
- Model/simulate system alternatives to collect other data stipulated by established decision criteria

- Compare the data from each alternative and select the preferred alternative or combine the best characteristics of several alternatives to define a preferred system solution
- Allocate system functions to the components of the preferred solution
- Finalize the preferred solution's physical architecture as a basis for system design and development activities
- Establish schedule and cost baselines for the preferred solution.

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The key output of the SA&E alternatives analysis and trade studies process is the identification and recommendation of feasible system alternatives.

For more information

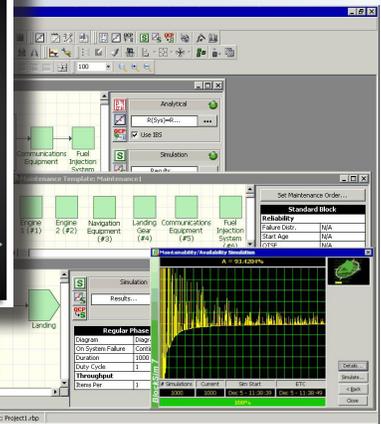
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Trade Studies

Trade studies are important aspects of alternative analysis. Conducted iteratively, trade studies compare alternative concepts using both to determine the an alternative’s potential to meet system objectives. Alternatives that are shown to be inferior are dropped from further consideration, and the remaining alternatives are carried forward to the next level of analysis. Trade studies provide insights into important factors such as:

- How the system will operate
- How the performance characteristics of a system

component affect other components and/or overall system performance

- How the system will interact with and affect other systems
- The potential impact of technical risks associated with particular alternatives, as well as programmatic risks associated with particular schedules or budget approaches.

This information provides a defensible basis for design decisions, reduces risk, and strengthens the final product.

Industry-standard and customized tools and techniques help

ensure that all analyses and trade studies are conducted according to stakeholder requirements and decision criteria, and that all pertinent environmental, technical, economic, and programmatic issues are considered in making informed, defensible decisions.

The key output of the SA&E alternatives analysis and trade studies process is the identification and recommendation of feasible system alternatives (e.g., strategies, technologies, and solution architectures) to satisfy system functions and their respective requirements.

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